

A SURVEY ON CROSS INFECTION HAZARDS ASSOCIATED WITH DENTAL IMPRESSION RECORDING

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ABSTRACT

Infection control ideology, disinfection / sterilization protocols and Cross infection control has been a baseline requirement for every invasive procedure. Dental Impression recording a pre-requisite for all dental procedures could be a source of cross infection if the protocols are not known, understood, accepted or followed. Aim of this study was thus to assess through a questionnaire the base line knowledge of dental students and dental graduates regarding infection control measurements associated with dental impression recording. A total of 78 House surgeons and Final Year students who consented were included in the study. The filled a valid questionnaire identifying the Dental Impression recording related cross infection issues. SPSS 17.0 was used for statistical evaluation. It was inferred that 66.7 % of study group felt that metallic impression trays and another 13% felt that disposable impression trays should be used to prevent cross contamination. It was an important finding that 93.6% of study group was aware of appropriate need of disposal of disposable impression trays however method of disposal were different. 100% study group was sending the impression out after washing or disinfecting them which were an incredible finding, however they should be encouraged for disinfection of impressions. It was thus inferred from the results that though students and graduates are well aware of infection control procedures and are following them however structured infection control standards teaching can improve standard further.

Key words: Dental Impression Trays, Dental Impressions, Cross infection

INTRODUCTION

Dentistry is predominantly a field of invasive human sciences, involving exposure to saliva and blood and therefore requires a high standard of infection control and safety practice in controlling cross-contamination.¹

One of the primary diagnostic steps, prerequisite for all dental procedures is recording dental impressions however potential for cross-infection from microbial contaminated dental impression trays and dental impressions has long been recognized.^{2,3} Studies have

shown higher level of microbial flora on impression trays, specially those which are porous and are being cleaned manually (though porous trays are preferred for retentive reasons) and also support that plastic impression trays if not disposable are a source of contamination even if gets disinfected and thus disposable plastic impression trays (with associated dimensional stability issue) and preferably autoclavable metallic impression trays are rated superior.^{4,5}

Impression Tray selection is an empirical step before actually recording a dental impression. Differ-

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ent practices are being followed for tray selection ranging from try in as such, to using calipers for recording transverse dental measurements to polythene covered trays. Clinician should be aware of concerns associated with the impression tray selection method they are following and whether they are following the guideline for tray selection or not.⁵

Several studies have shown that pathogenic microorganisms have been recovered from casts obtained from contaminated impressions.^{2,6-8} Casts can be treated by immersing the casts or spraying them with disinfecting solutions.⁹⁻¹¹ Chemical disinfectants can also be added directly to the dental stone.¹² However, these methods have been reported to compromise properties of the cast.¹³ Prevention of contaminated dental impressions leaving the immediate chair side area is thus a standard to control cross-contamination.^{12,13}

The responsibility of ensuring that whether impressions have been cleaned and disinfected before dispatch to the dental laboratory lies solely with the dentist. Uncertainty of impression disinfection risks both the health of the receiving dental technician and potential repeat disinfection of an already disinfected impression with detrimental consequences for its dimensions. Until 1991 rinsing impressions under running water was the recommended practice and has been shown to reduce the count of microorganisms present on the impression surface by approximately 90%, but a measurable bacterial load still remains on impressions and can be transferred to casts.^{14,15} Current recommendations advocate the use of disinfecting solutions.^{1,3} Moreover what type of disinfectant should be used, what disinfection regime should be followed and whether different dental impression materials need different disinfectants are important questions needed to be revisited.¹⁶⁻²⁰

METHODOLOGY

Dental Graduates and Dental Students of University College of Dentistry, The University of Lahore, were included in this study. A questionnaire considering the aims and objectives of this study was designed and was tested for reliability and validity. Non-probability purposive sampling technique was used to collect data with descriptive cross-sectional study design.

SPSS 17.0 was used for statistical evaluation. Descriptive Statistics were assessed for this Qualitative Data.

RESULTS

Results of this study have been discussed in table 1-11. It was inferred that 66.7 % of study group felt that metallic impression trays and another 13% felt that disposable impression trays should be used to prevent cross contamination as shown in table 2. It was an important finding that 93.6% of study group was aware of appropriate need of disposal of disposable impression trays however method of disposal were different as shown in table 5. It was interesting to find that 82.1% study group was selecting the impression tray by direct use intra-orally. Sterilized trays were thus being wasted for none, leading to increased sterilization load to meet infection control standards as shown in table 8. 100% study group was sending the impression out after washing or disinfecting them which was an incredible finding as shown in table 9.

TABLE 1: STATUS

		Frequency	Percent
Valid	House Surgeon	30	38.5
	Final Year Student	48	61.5
	Total	78	100.0

TABLE 2: IMPRESSION TRAY USED FOR TAKING IMPRESSION

		Frequency	Percent
Valid	Metallic	52	66.7
	Plastic	11	14.1
	Plastic & Metallic Both	2	2.6
	Disposable	13	16.7
	Total	78	100.0

TABLE 3: TYPE OF IMPRESSION TRAY USED

		Frequency	Percent
Valid	Porous	76	97.4
	Non-porous	1	1.3
	Both		
	Total	78	100.0

TABLE 4: HOW MATERIAL IS REMOVED FROM PORES IF POROUS IMPRESSION TRAYS ARE A USED

	Frequency	Percent
Valid Manual	67	85.9
Machine (Ultrasonic)	11	14.1
Total	78	100.0

TABLE 5: IF PLASTIC/DISPOSABLE IMPRESSION TRAY IS USED WHICH METHOD OF DISPOSAL IS PREFERRED

	Frequency	Percent
Valid Discard as such	19	24.4
Cut & destroy	47	60.3
Burn	3	3.8
Others	4	5.1
Not answered	5	6.4
Total	78	100.0

TABLE 6: TO PREVENT CROSS INFECTION PLASTIC IMPRESSION TRAYS ARE

	Frequency	Percent
Valid Disinfected	56	71.8
Sterilized	19	24.4
Disinfected & sterilized	3	3.8
Total	78	100.0

TABLE 7: TO PREVENT CROSS INFECTION METALLIC IMPRESSION TRAYS ARE

	Frequency	Percent
Valid Disinfected	16	20.5
Sterilized	60	76.9
Not answered	2	2.6
Total	78	100.0

TABLE 8: METHOD OF IMPRESSION TRAY SELECTION

	Frequency	Percent
Valid Directly in mouth	64	82.1
Inter-molar width assessment intra-orally	6	7.7
Polythene covering	4	5.1
Not answered	4	5.1
Total	78	100.0

TABLE 9: DO YOU WASH / DISINFECT YOUR IMPRESSIONS

	Frequency	Percent
Valid Wash	39	50.0
Disinfect	7	9.0
Wash & disinfect	32	41.0
Total	78	100.0

TABLE 10: IF YOU DO NOT DISINFECT THE IMPRESSION DO YOU BELIEVE IT MAY CAUSE SPREAD OF INFECTION

	Frequency	Percent
Valid Yes	76	97.4
No	2	2.6
Total	78	100.0

TABLE 11: STUDY MODELS/WORKING MODELS CARRY BACTERIA AND CAN BE A SOURCE OF SPREAD OF INFECTIONS

	Frequency	Percent
Valid Yes	73	93.6
No	5	6.4
Total	78	100.0

DISCUSSION

Saliva is normally contaminated with blood from gingival inflammatory tissue and therefore it is possible that HIV, HBV, mycobacterium tuberculosis and few other infections could spread from one individual to another through saliva.^{21,23} Dental Impressions a pre-requisite for all dental procedures having a direct contact with saliva / blood at times is thus a potential source of cross –infection as all links necessary for infection spread as shown in fig 1 are chained.

Metallic Porous Impression trays are usually preferred as these can be disinfected and then sterilized in an autoclave. Disposable impression trays have also gained popularity in the recent past however when disposable plastic stock trays were tested in conjunction with very high-viscosity impression materials there was distortion of the tray both across the arch and in cross section.^{4,5} Present study showed that study group understands that with metallic impression trays better infection control is possible. Moreover they also understand the importance of disposable impression

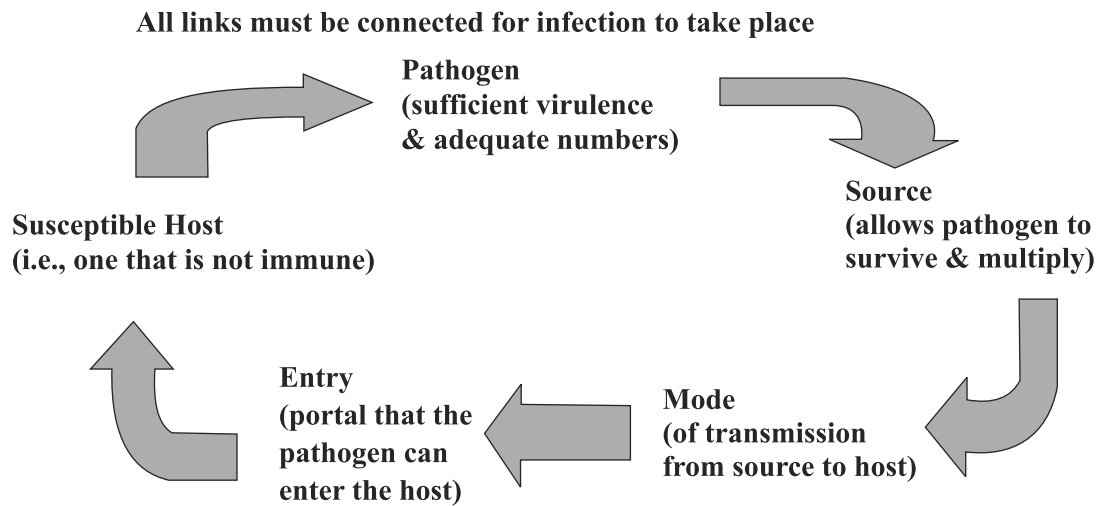


Fig 1: Chain of infection

trays with possible limitations as shown in table 2 & 3. Use of ultra-sonic machine to remove impression material from trays was also considered important as manual though efficient but laborious method is still being in practice as shown in table 4.

Impression Tray selection is an empirical step before actually recording a dental impression. Different practices are being followed for tray selection however clinician should be aware of concerns associated with the impression tray selection method they are following.¹ 82.1% study group was selecting impression trays by direct intra-oral approach which leads to extra sterilization cost and thus was defiantly not an effective method as shown in table 8. House surgeons and student appreciated that other effective methods such as tray covered in some polythene module must be practiced for tray selection.

Prevention of contaminated dental impressions leaving the immediate chair side area is thus a standard to control cross-contamination.²⁴ Various regulatory bodies in the dental profession have provided guidelines regarding the disinfection of impressions.²⁵ Disinfection of impressions is now considered a routine procedure in dental settings in most countries.^{26,27} Blair FM, Wassell RW highlighted that there is no universally recognized impression disinfection/sterilization protocol. It is recommended that all impressions should at least undergo a disinfecting procedure by immersion in 1% sodium hypochlorite for a minimum of 10 minutes.³ Almortadi N, Chadwick RG concluded in their study that compliance to accepted standards of disinfection

of dental impressions is empirical.¹⁶ Matalon S, et al in their study concluded that disinfection of impression should be preferred over a simple wash.²⁸ Muller-Bolla M et al in their study tried to find out that whether different disinfectants are needed for different impression materials and concluded that same disinfection procedure for both irreversible hydrocolloid and silicone impressions was used by 78% of European Union dental schools with almost same efficacy.²⁹ In present study it was concluded that study group do understand that impressions are source of contamination and are following either simple wash or disinfection, however based on studies disinfection of dental impression should be preferred as shown in table 9.

CONCLUSIONS

It was thus concluded that though students and graduates are well aware of infection control procedures and are following them however structured infection control teaching can improve standards further.

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